and a dry, dusty climate where frequent air inversions can cause smoke to linger for days.

While McCarthy admits he cannot prove that any particular patient has been injured by the smoke, he says his medical experience is persuasive. For example, he says, patients who travel during the burning season tell him, "As soon as I get out of Spokane, I feel better, and as soon as I get back, I feel worse." The evidence may be anecdotal, McCarthy adds, but "so many have told me this, it's become a reality for me."

Roe Roberts, an associate professor of health administration at Eastern Washington University in Spokane, studied the effects of grass-fire smoke in eastern Washington during the mid-1990s. Her research, published in the June 1998 issue of the *Journal of Environmental Health*, found that concentrations of smoke particles smaller than 2.5 microns in diameter correlated with weekend purchases of bronchodilators, which are used to open bronchial airways. Roberts says that because weekend purchases often represent emergency purchases, they provide an indirect measure of the effects of smoke on lung-disease patients.

Even some wheat growers recognize the problem. In the July 1999 issue of the trade journal *Wheat Life*, David Roseberry, past president of the Washington Association of Wheat Growers, wrote, "Evidence affirming the negative consequences of inhaling smoke—all smoke, not just cigarette smoke—has been continuously building to a surprising extent."

Department of Ecology spokesman Larry Altose says the department recognizes that "smoke from agricultural fires is causing serious health problems and people are very interested in addressing this issue to bring it under control." The Washington Association of Wheat Growers signed an agreement with the Department of Ecology in February 1999 specifying a 50% decline in burning over seven years. Altose says permits are issued to farmers who show that burning is "necessary according to best management practices."

Hoffman says the 50% overall reduction mandated by the agreement will not protect public health because it was based on 1998 figures, when a record amount of acreage was burned. But Altose says the Department of Ecology believes the 50% reduction will make a big difference, especially when coupled with new "best management" practices used by farmers, which discourage the use of fire. "We've already seen burning decrease by 50% this fall," he says. **–David J. Tenenbaum**

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American Farmland Trust

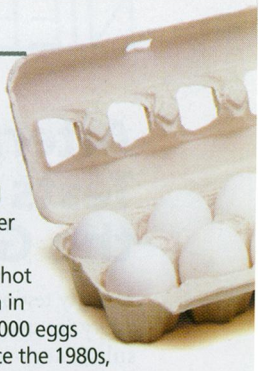
According to the American Farmland Trust (AFT), the United States has lost over 31 million acres of farmland since 1970. As the U.S. population grows and improvements in transportation and communication make suburban life more appealing, the loss of farmland could accelerate. If that happens, the United States could lose its position as one of the world's primary exporters of farm products—a situation that the AFT is working to prevent.

American Farmland Trust

One way the group is communicating its message is through its Web site, located at http://www.farmland.org/. The site includes details of the group's policy efforts including the Competition for Land project, which seeks appropriate ways for governments to protect the nation's farmland without sacrificing the rights of the farmers that own it, and information on federal farm legislation such as bills to reauthorize the 1996 Farmland Protection Program, which provides funding to state, local, and tribal entities to purchase easements or other land in order to protect farmland from development.

The AFT is concerned not just with development but also with environmentally sound use of farmland. To this end, the site contains details of the group's $10,000 Steward of the Land Award, which is awarded annually to a farmer who has worked to protect farmland and the environment. The AFT also sponsors scientific study through its academic research arm, the Center for Agriculture and the Environment, based at Northern Illinois University in De Kalb. The center's work, described on the site, includes an ongoing investigation of integrated pest management practices, which is being administered in conjunction with the U.S. Environmental Protection Agency, as well as the publication of several reports such as *Farming on the Edge*, a comprehensive look at the loss of prime and unique farmland in areas across the United States. **–Christopher G. Reuther**

The Beat



Raw Eggs Are Ready to Eat

New food safety rules proposed by President Clinton in December 1999 could increase use of a pasteurization system that uses hot baths to kill *Salmonella* bacteria in raw eggs. An estimated 1 in 20,000 eggs is infected with *Salmonella*. Since the 1980s, *Salmonella* has affected more than 300,000 people annually in the United States. The rules are intended to halve *Salmonella* infections by 2005 and eliminate them by 2010.

The new rules encourage use of pasteurization by allowing egg producers to skip some *Salmonella* testing of their hens if eggs are pasteurized before being shipped to market. The pasteurized eggs, which will cost an extra 3¢ per egg, are due in several grocery chains in the eastern United States by the spring. The eggs, which will be safe to eat raw, will come with a Department of Agriculture seal to verify they have been sterilized.

Antibiotics on the Farm

In the 1950s researchers found that animals fed antibiotics grew faster than those that weren't, and the practice became routine in commercial livestock farming. On 8 December 1999, the Food and Drug Administration (FDA) issued a report stating that up to 5,000 Americans may have suffered longer-lasting food poisoning in 1998 because they caught an antibiotic-resistant strain of *Campylobacter* from eating chicken. The FDA formulated its estimate using a mathematical model that relates the prevalence of fluoroquinolone-resistant *Campylobacter* infections in people who ate chicken to the prevalence of the bacteria in the birds themselves.

Many public health experts say the use of antibiotics in food animals worsens the problem of bacterial resistance and antibiotic ineffectiveness, although the animal drug industry insists there is no serious risk to consumers. The FDA says its model could become a tool for assessing such risks in the future.

Friendly Phosphates

A new technology developed by Alan Goldstein of Alfred University and colleagues at the Idaho National Engineering and Environmental Laboratory may transform the way phosphate fertilizers, the second most widely used agricultural chemical, are produced, thereby reducing their damaging effects on the environment.

The new pellet-form fertilizer uses bacteria to convert raw phosphate ore into fertilizer in the soil, replacing the energy-intensive conventional smelting process, which currently consumes 1% of the total energy used in the United States. The new fertilizer releases soluble phosphate slowly in response to the growth of the bacteria. Farmers often have to overapply conventional phosphate fertilizers because they are easily washed away, often into groundwater or surface water, causing heavy algal growth that can destroy wetlands and marine ecosystems.